

IN THE DRAWINGS:

Please substitute the enclosed corrected sheet 1/6 of formal drawings, including Fig. 1 and identified in the upper right corner as "Replacement Sheet," for the sheet 1/6 of the formal drawings currently on file. The drawings have been corrected to the actuators and an electronic controller, as required by the Examiner.

REMARKS

By the foregoing amendment, the specification has been amended to identify the actuators and the electronic controller in the drawings, and to correct a prior duplication of reference number 21, Fig. 1 has been amended to show the actuators and the electronic controller and to correct the prior duplication of reference number 21, and new Claim 31 has been amended. Claims 1-4, 15, 16, 26, and 29-31 remain pending. Favorable reconsideration of the application is respectfully requested.

Rejections under 35 U.S.C. § 112, second paragraph:

Claims 1-4, 15, 16, 26, 29 and 30 were rejected under 35 U.S.C. § 112, *second paragraph*, as being incomplete for omitting essential elements, with reference to MPEP § 2172.01. The Examiner indicated that the omitted elements were 1) an actuator mechanism/means which opens and closes the exhaust valves; and 2) an electronic controller which receives changes in engine speed as inputs and controls the actuator mechanism/means to open and close the exhaust/inlet valves. The Examiner indicated that without the actuator mechanism/means and the electronic controller, the exhaust/inlet valves do not perform their functions of opening/closing, or adjusting, or restricting, or varying the flow rate of the exhaust gas to be delivered into the first exhaust duct or the second exhaust duct.

According to MPEP § 2172.01, "a claim which fails to interrelate essential elements of the invention as defined by applicant(s) in the specification may be rejected under 35 U.S.C. 112, second paragraph, for failure to point out and distinctly claim the invention." The Examiner has not asserted that the claims fail to interrelate essential elements of the invention as defined in the specification, so that the rejection under 35 U.S.C. § 112, *second paragraph* should be withdrawn as failing to state proper grounds for the rejection.

According to MPEP § 2172.01, "A claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may be rejected under 35 U.S.C. 112, first paragraph, as not enabling. *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). See also MPEP § 2164.08(c). Such essential matter may include missing elements, steps or necessary structural cooperative relationships of elements described by the applicant(s) as necessary to practice the invention." Assuming that the Examiner intended to reject Claims 1-4, 15, 16, 26, 29 and 30 were rejected under 35 U.S.C. § 112, *first paragraph*, as

omitting matter disclosed to be essential to the invention as described in the specification or in other statements of record, the Examiner has not asserted any basis whatsoever in the specification or in other statements of record that the claims omit matter disclosed to be essential to the invention as described in the specification or in other statements of record, as required in MPEP § 2172.01, so that the rejection of Claims 1-4, 15, 16, 26, 29 and 30 under 35 U.S.C. § 112, second paragraph, or 35 U.S.C. § 112, first paragraph, should be withdrawn as failing to state proper grounds for the rejection.

Further more, according to MPEP § 2164.08(c) "A feature which is taught as critical in a specification and is not recited in the claims should result in a rejection of such claim under the enablement provision section of 35 U.S.C. 112. See *In re Mayhew*, 527 F.2d 1229, 1233, 188 USPQ 356, 358 (CCPA 1976). In determining whether an unclaimed feature is critical, the entire disclosure must be considered. Features which are merely preferred are not to be considered critical. In re Goffe, 542 F.2d 564, 567, 191 USPQ 429, 431 (CCPA 1976). Limiting an applicant to the preferred materials in the absence of limiting prior art would not serve the constitutional purpose of promoting the progress in the useful arts. Therefore, an enablement rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended. Broad language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality."

The Examiner has cited no prior art requiring the limitations of an actuator and electrical controller. Furthermore, the specification discloses at paragraph [0057] that "inlet valves "i" described above would preferably themselves be controlled by actuators under the control of the electronic controller but this is not necessary and any form of operation of the valves could be used, e.g. conventional cam and tappet operation." It is therefore respectfully submitted that the specification makes clear that it is merely preferred, and not essential, to provide an electronic controller which receives changes in engine speed as inputs and controls an actuator mechanism/means to open and close exhaust/inlet valves, and that the rejection of Claims 1-4, 15, 16, 26, 29 and 30 under 35 U.S.C. § 112, second paragraph, or 35 U.S.C. § 112, first paragraph, should be withdrawn.

Rejections under 35 U.S.C. § 103(a):

Claims 1-3 and 15 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Yamane (JP 61-164039 A) in view of Santo (JP 01-285619 A). The Examiner acknowledged that Yamane fails to disclose opening and closing of a first exhaust valve and opening and closing of a second exhaust valve controlling a proportion of flow of exhaust gas which flows through a first exhaust duct to a first turbocharger relative to a second exhaust duct being varied by variation of opening and closing of the first exhaust valve with changes in engine speed.

The Examiner referred to the claim of Santo at lines 1-6; Santo at page 3, lines 17-34, and page 4, lines 7-16, as teaching that it is conventional to utilize the opening and closing of a first exhaust valve (5) and the opening and closing of a second exhaust valve (4) controlling the proportion of flow of exhaust gas which flows through the first exhaust duct (9) to a first turbocharger (12) relative to the second exhaust duct (8) being varied by variation of opening and closing of the first exhaust valve (5) with changes in engine speed. The Examiner referred to lines 1-6 of the claim in Santo, and page 3, lines 17-34 of Santo as disclosing the proportion of flow of exhaust gas which flows through the first turbocharger being varied by variation of opening and closing of the first exhaust valve relative to the second exhaust gas valve with changes in engine speed; and a catalytic converter (15) receiving combusted gases leaving the second turbocharger then to the atmosphere.

Claim 1 recites "wherein opening and closing of the first exhaust valve and opening and closing of the second exhaust valve controls the proportion of the flow of exhaust gas which flows through the first exhaust duct to the first turbocharger relative to the second exhaust duct, and the proportion of the flow of exhaust gas which flows through the first exhaust duct relative to the second exhaust duct being varied by variation of opening and closing of the first exhaust valve with changes in engine speed."

In the claim of Santo, at page 2, lines 2-5, it is recited that all exhaust valve apparatus is "provided that starts the drive of the second exhaust-type supercharger by steadily opening the second exhaust valve from the point in time at which the supercharging by means of the first exhaust-type supercharger reaches its maximum supercharging pressure." At page 2, lines 23-26, Santo further teaches the exhaust valve apparatus (35) with a variable lift function is provided that starts the drive of the second exhaust type supercharger (12) by steadily opening

the second exhaust valve (5) from the point in time at which the supercharging by means of the first exhaust type supercharger (11) reaches its maximum supercharging pressure. Further at page 4, lines 7-16, Santo discloses the first exhaust valve (4) with intake and exhaust valves that operate in the entire operating range from the low speed region to the high speed region, and the exhaust valve (5) comprising intake and exhaust valves with a low speed body stop function that operate only in the high speed region. It is therefore clear that in Santo the proportion of flow of exhaust gas which flows through the first exhaust duct relative to the second exhaust duct is independent of the opening and closing of the first exhaust valve with changes in engine speed, and is only dependent on the first exhaust type supercharger reaching it maximum supercharging pressure, before the second exhaust valve even begins to open. It is therefore respectfully submitted that Santo clearly teaches away from the invention as claimed.

It is noted that the Board has disapproved of obviousness objections that are based on hindsight:

"We find no suggestion to combine the teachings and suggestions...as advanced by the Examiner, except from using Appellants' invention as a template through a hindsight reconstruction of Appellants' claims. *Ex Parte Crawford et al*, Appeal 20062429, Decided May 30, 2007."

And, the Board also cautions:

"[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006) cited with approval in the KSR case.)

It is respectfully submitted that there is no evidence in the combination of Yamane and Santo of any teaching or suggestion of the proportion of the flow of exhaust gas which flows through the first exhaust duct relative to the second exhaust duct being varied by variation of opening and closing of the first exhaust valve with changes in engine speed, as is claimed. It is therefore respectfully submitted that Claims 1-3 and 15 patentably distinguish the combination of

Yamane and Santo, and that the rejection of Claims 1-3 and 15 on the grounds of obviousness from Yamane in view of Santo should be withdrawn.

Claims 4, 26 and 29 were rejected under 35 U.S.C. §103(a) on the grounds of obviousness from Yamane in view of Santo, and further in view of Hirabayashi. Hirabayashi was cited as disclosing the use of a bypass passage. Claims 4, 26 and 29 depend from Claim 1, discussed above. It is respectfully submitted that there is no evidence in the combination of Yamane, Santo and Hirabayashi of any teaching or suggestion of the proportion of the flow of exhaust gas which flows through the first exhaust duct relative to the second exhaust duct being varied by variation of opening and closing of the first exhaust valve with changes in engine speed, as is claimed. It is therefore respectfully submitted that Claims 4, 26 and 29 patentably distinguish the combination of Yamane, Santo and Hirabayashi, and that the rejection of Claims 4, 26 and 29 on the grounds of obviousness from Yamane in view of Santo, and further in view of Hirabayashi should be withdrawn.

Claim 16 was rejected under 35 U.S.C. §103(a) as obvious over Yamane in view of Santo, and further in view of either Lovell or Gray. Lovell and Gray were cited as disclosing closing of exhaust valve means during the upstroke of the piston in order to trap combusted gases in the combustion chamber, and the trapped combusted gases forming a mixture with the fuel and air and serving to delay ignition of the fuel and air mixture when the engine is operating in a first combustion mode with homogenous charge compression ignition. Claim 16 depends from Claim 1, discussed above. It is respectfully submitted that there is no evidence in the combination of Yamane, Santo, Lovell and Gray of any teaching or suggestion of the proportion of the flow of exhaust gas which flows through the first exhaust duct relative to the second exhaust duct being varied by variation of opening and closing of the first exhaust valve with changes in engine speed, as is claimed. It is therefore respectfully submitted that Claim 16 patentably distinguishes the combination of Yamane, Santo, Lovell and Gray, and that the rejection of Claim 16 on the grounds of obviousness from Yamane in view of Santo, and further in view of either Lovell or Gray should be withdrawn.

Claim 30 was rejected under 35 U.S.C. §103(a) as obvious over Yamane in view of Santo and Hirabayashi and further in view of either Lovell or Gray. Claim 30 depends from Claim 1, discussed above. It is respectfully submitted that there is no evidence in the combination of

Yamane, Santo, Hirabayashi, Lovell and Gray of any teaching or suggestion of the proportion of the flow of exhaust gas which flows through the first exhaust duct relative to the second exhaust duct being varied by variation of opening and closing of the first exhaust valve with changes in engine speed, as is claimed. It is therefore respectfully submitted that Claim 30 patentably distinguishes the combination of Yamane, Santo, Hirabayashi, Lovell and Gray, and that the rejection of Claim 30 on the grounds of obviousness from Yamane in view of Santo and Hirabayashi, and further in view of either Lovell or Gray, should be withdrawn.

New Claim 31 repeats the subject matter of present Claim 1, but for the addition of the feature of the bypass valve. Specifically, new Claim 31 now recites "the compressor means additionally including a bypass passage having a bypass valve controlled by the electronic controller, configured to receive a proportion of the compressed air at the first pressure from the second turbocharger, and supply the same to the combustion chamber without passing through the first turbocharger," and "the bypass valve controls the proportion of the compressed air from the second turbocharger received by the bypass passage relative to the first turbocharger, the proportion being varied with changes in engine speed." Support for the amendment can be found in the specification at page 8, line 18, to page 9, line 2, for example. New Claim 31 also reinstates the features of the actuator means and the electronic controller, for which support has been added in the amendment to the specification and drawings.

Without a bypass valve providing a path for compressed charge air from the low pressure turbocharger to the engine without passing through the high pressure turbocharger, then all charge air must pass through the high pressure turbocharger even when it is not being driven (or when it is driven by only a small proportion of the exhaust gases). The high pressure turbocharger therefore provides an unwanted restriction in the flow of charge air into the engine that is avoided by the provision of the bypass valve.

Such a bypass valve is not disclosed in either Santo or Yamane. Moreover, the addition of a bypass valve would not be an appropriate modification of Santo, since the turbochargers are provided in parallel, whilst in Yamane, it is unnecessary because both turbochargers are in use at all times.

It is respectfully submitted that one skilled in the art would not combine Santo and Yamane in the proposed manner, since this would lead to an engine in which all charge air

compressed by the low pressure turbocharger must flow through the compressor of the high pressure turbocharger even when it is deactivated, thereby restricting the flow of charge air into the engine.

In light of the above amendments and remarks, it is respectfully submitted that the application is in condition for allowance, and an early favorable action in this regard is respectfully requested.

The commissioner is authorized to charge any deficiencies in fees or credit any overpayments to our Deposit Account No. 06-2425.

Respectfully submitted,

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Encl: Replacement sheet 1/6 of formal drawings

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